Poly-and monosituational riskmetric models of environmental security

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The purpose of the paper is to formulate models of integral risk in environmental security. The main tasks to be solved are:

1) Formulation of a new structure of integral risks;

2) Creation of an universal situational risk models.

To solve the first problem a new architecture of integral risk is constructed. Based on this sample it is composed a universal polisituational graph of the risk genesis. Unlike the other existing graph-patterns this model presents the risk as a function of the time. This is done by considering the temporal development of components and by fixing the duration of the emissions, immissions and contacts.

The matter of polisituational model is formulated by introducing sets of components. The relationships between initiation phenomenon-impacts are recreated. The model simulates the occurrence and evolution of dangerous phenomena.

This is consistent with the occurrence of multitudes of the necessities of the activity, actions, causes, sources, risk factor and its emission level, time of the issue. The result is a multitude of dangerous phenomena. Each of the sets depends on time multitude.

The dangerous phenomenon is graphically presented. It is consistently associated with a pattern of dangerous phenomena.

It includes a multitudes of dispersion media, space, emerging immission that can not be the nature of the emissions but their derivatives, immission level, time of immission, the site of the impact of immission, the contact areas. The result is a multitude of dangerous effects. These sets appear and take place in function of the time multitude [1].

Dangerous effects model is consistent with the pattern of dangerous effects. It includes a multitude of the types of damage and their location, severity and size, compensation and rehabilitation. It result is many dangerous effects.

All component sets depend on the time and are associated with its multitude. The models include new structural elements that are linked with a chain of events, unimplemented so far. Each multitude has a different number of elements, depending on the complexity and specificity of the investigated danger.

A result is a complicated graph model [2], which must be analyzed and it can be extracted the model of situational oriented connection between integral components of risk.

Polisituational risk model requires prior formalization of dangers by creating scenarios of all potentially dangerous situations that may appear. These scenarios are the result of subjective analytical activity.

However, they need to be linguistically described. It's not just a verbal to be formalized, but to be written out. Therefore, the condition for creating the polisituational danger's graphs is their linguistic formalization.

The monosituational risk model contains three types of risks, corresponding to the graph of the integral risk- indicator risks, component risks and integral risk. The model captures the causal relationships between events constituting indicator risks, indicator-component risks, risks between components and between integral risk. The model is integral. It can be used to objectively analyze and assess risk, as it recreates the integral dangers and present in details the main components. It has universal parameters.

The risk is defined as a three-dimensional object associated with a specific and real existing system, natural or anthropogenic conditions, processes, phenomenon and effects. It is described in the orthogonal coordinate system with the time risks by which the integral risk component are represented as a variable as a function of time.

Poly-and monosituational riskmetric models are complex and multi-dimensional objects. They are the development of the theory of integral risk. Using them a new structure, logic and versatility of application appears.

The risk is presented in a different coordinate system in which, on the one hand, indicates the time and, on the other- the transformation of the risk factors in the indicator risks and in components of the integral risk. These transformations reflect the dynamics of transitions of risks causal chains and hierarchy. It is universal because through the multitudes of the situations and events it can be represent unlimited types of dangers.

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2. Vladimirov, L. Risk-informational media in the environmental security. Varna Scientific Almanac of Varna Free University, 2010. Book.14, p.66-73

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